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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,006	01/15/2002	Scott M. Hartley	101-27	6356

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EXAMINER

ZACHARIA, RAMSEY E

ART UNIT PAPER NUMBER

1773

DATE MAILED: 02/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/047,006

**Applicant(s)**

HARTLEY ET AL.

**Examiner**

Ramsey Zacharia

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2004 and 08 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-21,23-32 and 34-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-21,23-32 and 34-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### *Claim Rejections - 35 USC § 102*

2. Claims 1-6, 8-21, 23-32, and 34-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones et al. (WO 00/20157).

Jones et al. teach a welded workpiece formed by exposing the joint region at the weld to radiation so as to melt the surface of one or both pieces at the joint, then allowing the melted material to cool and weld the workpiece together (page 1, lines 27-33). A radiation absorbing material is provided in the joint region (page 1, lines 34-36). The radiation absorbing material is an NIR dye having a high molar absorption coefficient, good solubility in the host polymer, and does not degrade to colored by-products (page 3, lines 10-20). The dyes also have high extinction coefficients (page 3, lines 29-32). The dye can be incorporated into the joint region in several ways including as part of a polymer film placed between the two pieces to be welded together or as a coating solution applied to the surface by dipping, infusion, painting or spraying (page 4, line 22-page 5, line 34). A suitable concentration of the dye is 0.001-0.1  $\mu\text{g}/\text{mm}^2$ , i.e. 1-100  $\text{ng}/\text{mm}^2$  (page 10, lines 16-34).

Because the radiation absorbing material in the joint region of Jones et al. appears to be the same as that used in the instant invention (i.e. 1-100  $\text{ng}/\text{mm}^2$  of an NIR dye having high absorption and extinction coefficients that degrades to a non-colored by-product) it is taken to

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inherently be capable of converting inbound radiant energy at a welding wavelength over about  $0.1 \text{ J/mm}^2$ . Moreover, because the dye is miscible in the polymer (as evidenced by the teaching that the dye may be incorporated into a polymer film or the polymer workpiece itself), the degradation by-products should also be miscible in the polymer.

Regarding claim 9, the depth to which the dye penetrates when applied as a coating onto the surface of one of the workpieces must inherently be sufficiently small to avoid foaming during welding since Jones et al. do not teach that the welding causes foaming. Moreover, if foaming were present, the appearance of the joint would be affected. Since the welding process Jones et al. does not affect the appearance of welded joint, there can be no foaming.

Regarding claim 10, the limitations of this claim are met since the claim is directed to the workpiece which contains, at most, only a residual amount of solvent. Therefore, the concentration of the dye in the solvent prior to deposition does not affect the final product since the solvent is evaporated off during the formation of the product.

Regarding claim 21, the transmission through the joint region of Jones et al. at the welding wavelength is lower than the optical transmission through the bulk portions because the joint region is designed to absorb energy at the welding wavelength and the bulk portions are designed to be optically transparent. The radiation absorbing material in the joint region of Jones et al. is taken to inherently be capable of converting the radiation into thermal energy via successive electronic-to-thermal and chemical-to-thermal conversion activities because it is designed to heat up the joint region and the material appears to be the same as used in the instant invention (i.e.  $1\text{-}100 \text{ ng/mm}^2$  of an NIR dye having high absorption and extinction coefficients that degrades to a non-colored by-product).

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Regarding the optical properties recited in claims 14-21, since the material used by Jones et al. appears to be the same as that used in the instant invention (i.e. 1-100 ng/mm<sup>2</sup> of an NIR dye having high absorption and extinction coefficients that degrades to a non-colored by-product), it should inherently have the same optical properties.

***Claim Rejections - 35 USC § 103***

3. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (WO 00/20157).

Jones et al. teach all the limitations of claim 37, as outlined above, except for the concentration of the dye in the coating solution.

However, Jones et al. do teach that the dye may be applied to the joint region as a coating composition to a final coating weight of 1-100 ng/mm<sup>2</sup>. The concentration of the coating solution affects the coating weight of the final product. That is, the concentration is a results effective variable.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the concentration of dye in the coating solution, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

***Response to Arguments***

4. Applicant's arguments filed 08 October 2004 have been fully considered but they are not persuasive.

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The applicants argue that Jones et al. do not teach the use of a visible light absorbing dye. However, as the dye recited in the claims is not restricted to a visible light absorbing dye but may also be other dyes, including a near infrared absorbing dye, this argument is immaterial.

The applicants argue that Jones et al. merely disclose the welding of a fabric which cannot be equivalent to a workpiece having a bulk portion as claimed because a dye cannot be deposited simply on or above a fabric surface but would necessarily be absorbed and thus deposited below its surface as well.

This is not persuasive for the following reasons. In the applicants' own specification, textiles are cited as suitable workpieces (see page 10, lines 21-22). Therefore, by the applicants' own admission, a fabric is a weldable workpiece having a bulk portion. Furthermore, Jones et al. is not limited to a fabric but explicitly discloses a workpiece throughout the reference (e.g., page 2, lines 6-7; page 3, lines 24-28; page 10, lines 1-14; claim 9). The first embodiment of the Examples is directed to the welding of two PMMA sheets, not fabrics. Finally, while the claims as written require the dye to be deposited on or above the surface of a workpiece, there is no requirement that the dye cannot also be present below the surface. Therefore, the fabric of Jones et al. reads on the instant claims since the dye is present on the surface of the fabric as well as below the surface of the fabric.

With respect to claim 9, the applicants allege that Jones et al. does not teach that welding causes foaming because Jones et al. fails to disclose any use of a solvent with a dye. However, as noted above, Jones et al. do teach that the dye can be incorporated into the joint region in several ways including by dipping, painting or spraying (see page 4, line 22-page 5, line 34).

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With respect to claim 10, the applicants submit that the claimed concentration of dye in the liquid solvent is necessary in the liquid solvent vehicle in order to deliver the surface deposition density of about 5-3000 ng/mm<sup>2</sup>.

However, it does not appear that the concentration of dye in the solvent must be about  $1 \times 10^{-2}$  to  $1 \times 10^{-4}$  g/ml since claims 8 and 9 both use a liquid solvent vehicle and neither claim limits the concentration of dye in the solvent. Furthermore, since the solvent is not present in the weldable workpiece, the concentration of dye in the solvent is immaterial to the claimed product because the solvent is not present in the product of claim 10.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramsey Zacharia whose telephone number is (571) 272-1518.

The examiner can normally be reached on Monday through Friday from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney, can be reached at (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Ramsey Zacharia**  
**Primary Examiner**  
**Tech Center 1700**